A. D. JONES.

AUTOMATIC SPARK ARRESTER.

APPLICATION FILED JAN. 23, 1920.

1,355,761.

Patented Oct. 12, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

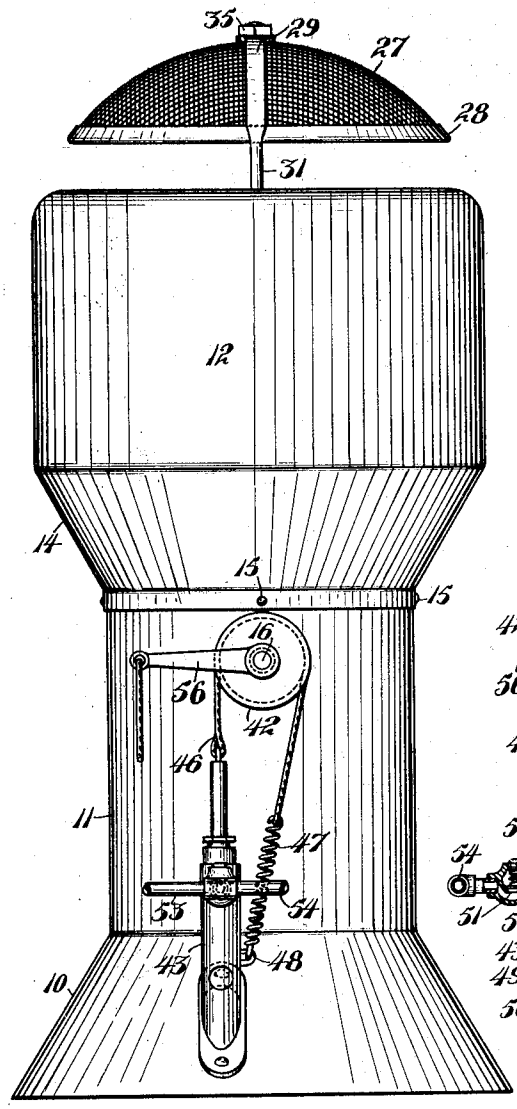
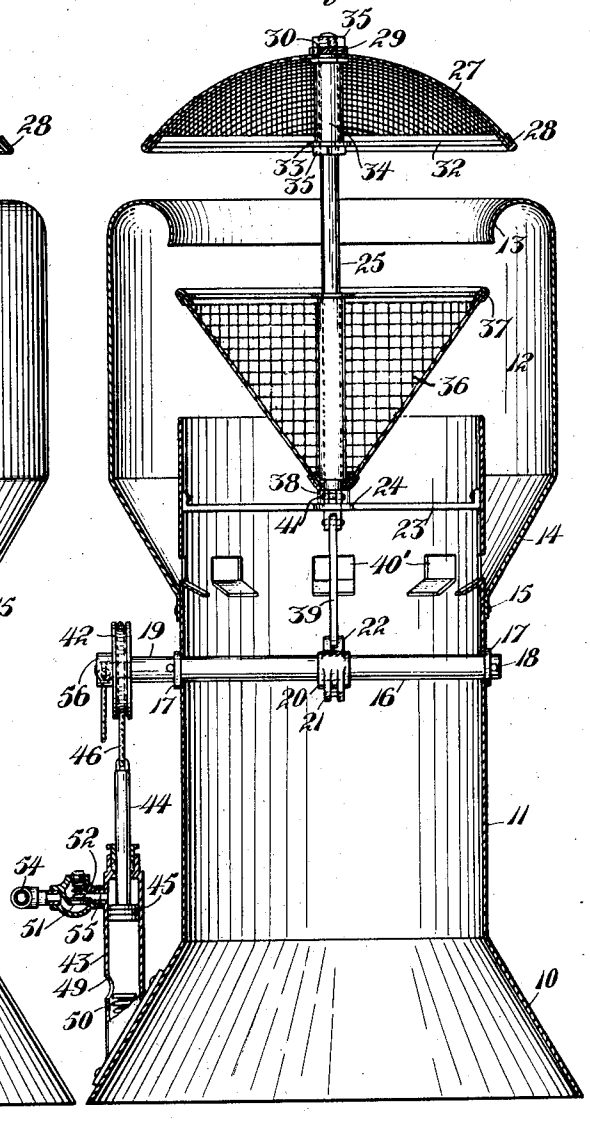


Fig. 2.



INVENTOR

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2 SHEETS—SHEET 2.

Fig. 3.

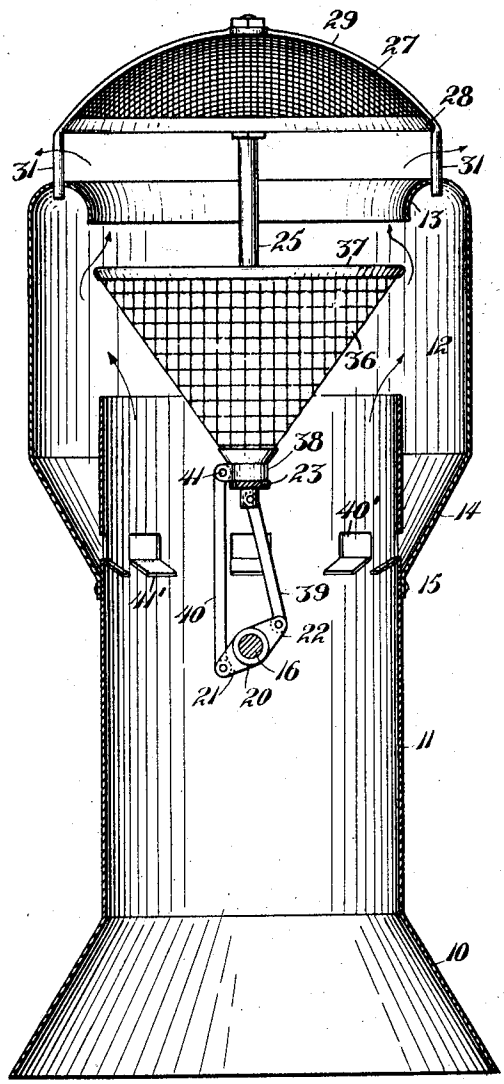
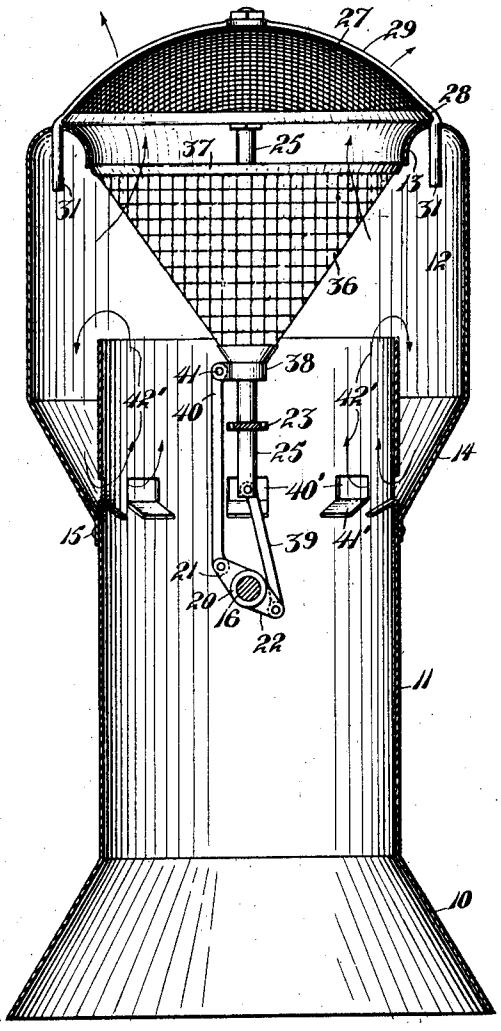


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALBERT D. JONES, OF QUINCY, CALIFORNIA.

AUTOMATIC SPARK-ARRESTER.

1,355,761. Specification of Letters Patent. Patented Oct. 12, 1920.

Application filed January 23, 1920. Serial No. 353,495.

To all whom it may concern:

Be it known that I, ALBERT D. JONES, a citizen of the United States, residing at Quincy, in the county of Plumas and State of California, have invented new and useful Improvements in Automatic Spark-Arresters, of which the following is a specification.

This invention relates to spark arresters.

The different types of spark arresters known and used have been such that it required manual means for lowering or raising the spark arrester in order to give a proper draft to the engine in case the same had not been running and it was desired to bring up the steam. In this manner many times the spark arrester was left in its off position after the steam had been brought up and the engine started, thus permitting large sparks to fly from the stack and causing fires. Also, in the different types of spark arresters heretofore known and used, the screen members disposed over the stack have usually been of such a mesh that large enough sparks could be forced therethrough which would hold their fire until they reached the earth and thus causing damage. This is true from the fact that in case smaller mesh wire for the screen members was used, the screens would become clogged and would often have to be cleaned before they could properly perform their intended function.

It is an object of this invention to provide a spark arrester utilizing two screen members disposed over the top of the stack and arranged to be brought to an open or closed position, the open position representing that the screens are not disposed over the outlet of the stack and the closed position representing the disposal of the screen members over the outlet of the stack; and also to bring about this operation automatically with the starting and shutting down of the engine, respectively.

It is also an object of the invention to provide a spark arrester as above characterized in which the larger sparks as they ascend the stack are thrown against the lower screen member and then if of too large a size are thrown therefrom to travel in a circuitous path at the end of which they will be again thrown against this lower screen member and so continued until these sparks become fine enough to pass through the said member, after which they are broken again through a finer mesh screen member and then to the atmosphere. In this way any large spark has been pulverized before it reaches the atmosphere and therefore no danger of fire from the same is presented.

It is the general object of the invention to provide such a device as above characterized which will be inexpensive to manufacture and simple in its construction. With the above and other objects in view the invention consists of the novel features of construction, combination and arrangement of parts as illustrated in the drawings, of which:

Figure 1 is a side elevation.

Fig. 2 is a vertical central sectional view taken at right angles to Fig. 1.

Fig. 3 is a vertical central sectional view taken at right angles to Fig. 2 and showing the open position of the screen members.

Fig. 4 is a view similar to Fig. 3 and showing the closed position of the screen members.

Referring to the drawings in detail, 10 indicates the usual breeching, 11 the stack, and 12 a stub stack or in this instance, the casing for the spark arrester. The upper end of the stub stack 12 is flanged inwardly and downwardly forming the lip 13, and its lower end is reduced as at 14, the reduced end being adapted to slide over the main stack 11 and be secured thereto as indicated by the rivets 15. Centrally of the main stack is mounted the transverse shaft 16, the same being secured against longitudinal movement by the washers 17 and pins 18. One end of the shaft is extended as indicated at 19, the purpose of which will later appear. Centrally of this shaft is mounted a crank member 20 having the radially disposed arms 21 and 22. Near the upper end of the main stack I provide a cross member 23 having an enlarged middle portion as indicated at 24. A rod 25 is mounted centrally of the main stack and stub stack and its lower end adapted to slide within the opening 24 provided in the transverse member 23. The rod 25 extends beyond the stub stack 12 and on the upper end thereof is secured the cap like screen member 27. This screen member 27 is of fine mesh and comprises a rim 28 and a rib-like member 29, the central portion of said

rib member being enlarged and an opening provided therein as indicated at 30. The ends of the rib member 29 are extended to form the pin-like members 31, said pin members acting as guides and adapted to slide within the openings provided in the lip 13. The screen member has a transverse member 32 extending between the inner sides of its rim and has an enlarged middle portion as indicated at 33 in which an opening is provided to accommodate the rod 25. The upper end of the rod 25 is threaded and a sleeve member 34 is positioned between the rib 29 and the cross member 32 and by the use of nuts indicated at 35, the screen member 27 is securely held.

A second screen member 36 is provided having a larger mesh than the member 27. This member 36 is in the shape of an inverted cone and comprises the rim member 37 and the collar-like member 38, the collar being freely slidable upon the rod 25. On the lower end of the rod 25 there is journaled the upper end of a link 39, the lower end of said link being journaled in the arm 22 of the arm member 20. The collar 38 of the screen member 36 is provided with lugs in which the upper end of a link member 40 is journaled as indicated at 41, the lower end of said link member being journaled in the other radial arm 21 of the arm member 20.

As has before been stated, the large stub stack 12 is adapted to slide down over the main stack 11 and thus as shown in Figs. 2, 3 and 4, there is provided a chamber between the exterior walls of the main stack and the enlarged portion of the stub stack. Circumferentially of the main stack there is provided a series of ports as indicated at 40′, the same being struck in the main stack and forming the aprons as indicated at 41′. The purpose of this chamber between the main stack and the enlarged portion of the stub stack and also the communication from this chamber to the interior of main stack is that when large sparks of such dimensions that will not pass through the screen member 36, they will be made to travel the circuitous path as indicated by the arrows 42′ of Fig. 4 and in this manner gradually pulverize themselves so that they may freely pass through the screen 36, after which by continuously being impelled against the finer mesh screen 27 they are further pulverized until practically a dust when they pass therethrough and are given up to the atmosphere.

On the extended end of the shaft 16 there is secured a pulley 42 and on the breeching 10 there is suitably mounted a vertical casing or cylinder 43. In the cylinder 43 there is provided a plunger or piston 44 carrying a piston head 45 and the upper end thereof secured to a cable or rope as at 46, the opposite end of said cable being secured to the one end of a coil spring 47 and the opposite end of said coil spring being in turn secured to the cylinder or casing 43 as at 48. In the bottom of the cylinder 43 there is provided an outlet as at 49 and also a spring as at 50 to take up the force of the piston 44. On the outer side of the cylinder 43 there is provided an outlet as at 55 and on which is threaded a check valve 51 having a small outlet as at 52, said outlet being open only when the check valve is closed. To this check valve there is threaded a T and leading therefrom are the pipes 53 and 54. Either the pipes 53 or 54 may be connected to the steam pipe of the engine and preferably below the throttle. The other pipe may be connected to the blower of the engine and by either of these means the piston may be operated to rotate the shaft 16, a crank 56 is formed on the pulley 42 and to this crank may be attached a rope or wire extending to and within reach of the engineer whereby the shaft 16 may be rotated to hold the screen members in their closed position or opened position as may be desired.

In the operation of this device assuming that the pipe 53 is connected below the throttle it would then be seen that whenever the engine was started the piston 44 would be shoved downwardly against the tension of the spring 47 and the shaft 16 turned which would raise the screen member 35 and lower the screen member 27, or, in other words, bring them to their closed position as shown in Fig. 4. When the steam was shut off or the engine shut down the tension of the spring 47 would rotate the shaft in the opposite direction and again bring the screen members to their open position as shown in Fig. 3. It also can be here noted that in case one of the pipes 53 or 54 were connected to the blower of an engine the same operation could be had.

It is also here to be noted that in case it is desired to retain the screen members in their closed position continuously by means of the rope connected to the crank 56 on the pulley 52, the shaft can be tied in the desired position for holding the screens closed. This crank member 56 can also be utilized in case the screen members become clogged with the ashes from the sparks or soot, by simply closing and opening the screen members, the jar therefrom will shake away the ashes or soot if they become caked, thus cleaning the screens.

While I have shown herein specifically, and described a spark arrester of the type which I consider most adaptable for donkey engines or the like where wood is principally used for fuel, it is to be understood, how-

ever, that the same with very few modifications could be made equally adaptable to any other engine using like fuel.

While I have shown the preferred form of my invention as now known to me it will be understood that various changes in the combination, construction and arrangement of parts may be made by those skilled in the art without departing from the spirit of the invention as claimed.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:

1. In a spark arrester including a main stack, a stub stack secured thereto, having an inturned lip, a rod mounted centrally of said stub stack, a pair of screens mounted on said rod, one exteriorly and the other interiorly of said stub stack, said internal screen being adapted to seat upon the inner rim of said inturned lip and said exterior screen adapted to seat on the exterior rim thereof, a shaft and connecting means whereby with the turning of said shaft in one direction the screens will be moved away from said lip and the turning of said shaft in the opposite direction will cause the screens to seat upon said lip.

2. In a spark arrester including a main stack, a stub stack secured thereto, having an inturned lip, a rod mounted centrally of said stub stack, a pair of screens mounted on said rod, one exteriorly and the other interiorly of said stub stack, said internal screen being adapted to seat upon the inner rim of said inturned lip and said exterior screen adapted to seat on the exterior rim thereof, a shaft and connecting means whereby with the turning of said shaft in one direction the screens will be moved away from said lip and the turning of said shaft in the opposite direction will cause the screens to seat upon said lip, and means for rotating said shaft, said means being controllable from a remote point.

3. In a spark arrester including a main stack, a stub stack secured thereto, a rod mounted centrally of said stub stack, a pair of screen members mounted on said rod, one exteriorly and the other interiorly of the outlet of said stub stack, a shaft, and connecting means whereby with turning or rocking movement of said shaft in one direction the screen members will be moved in opposite directions in respect to each other.

4. In a spark arrester including a main stack, a stub stack secured thereto, a rod mounted centrally of said stub stack, a pair of screen members mounted on said rod, one exteriorly and the other interiorly of the outlet of said stub stack, a shaft, connecting means whereby with turning or rocking movement of said shaft in one direction, the screen members will be moved in opposite directions with respect to each other, means for normally holding said shaft for retaining the screen members in their last mentioned positions and means for rotating said shaft to move the screens toward each other.

5. In combination, a main stack, an enlarged stub stack having a reduced end and adapted to slip over the main stack and be secured thereto, a chamber being formed between the enlarged portion of the stub stack and the exterior wall of the main stack, said chamber communicating with the interior of the main stack through a plurality of passages provided therein, and a pair of screen members disposed one exteriorly and one interiorly of said stub stack and the interior screen being of larger mesh than the exterior screen.

6. In combination, a main stack and a large stub stack having an inturned lip on its upper end, and at its lower end reduced and adapted to telescope over the main stack whereby a chamber is formed between the exterior wall of the main stack and the enlarged portion of the stub stack and a series of circumferential ports leading through the wall of said main stack from said chamber, a rod centrally and slidably mounted in said stack and extending from said stub stack, a screen member slidably mounted on said rod adapted to seat on the inner rim of said lip of the stub stack, and a second screen member secured on the upper end of said slidable rod and adapted to seat on the upper edge of said lip, a transverse shaft mounted in said main stack and connecting means between said shaft and said slidable screen and rod, whereby with the movement of said shaft the screen members may be simultaneously seated or brought to their closed position.

7. In combination, a main stack and a large stub stack having an inturned lip on its upper end, and at its lower end reduced and adapted to telescope over the main stack whereby a chamber is formed between the exterior wall of the main stack and the enlarged portion of the stub stack and a series of circumferential ports leading through the wall of said main stack from said chamber, a rod centrally and slidably mounted in said stack and extending from said stub stack, a screen member slidably mounted on said rod adapted to seat on the inner rim of said lip of the stub stack, and a second screen member secured on the upper end of said slidable rod and adapted to seat on the upper edge of said lip, a transverse shaft mounted in said main stack and connecting means between said shaft and said slidable screen and rod, whereby with the movement of said shaft the screen members may be simultaneously seated or brought to their closed position, and means connected to said shaft for holding said screen members in their open position.

8. In a spark arrester including a stack, a transverse shaft mounted within said stack, a rod mounted above said shaft and centrally of said stack, said rod carrying on its upper end a screen member adapted to seat over the outlet of said stack, a second screen member slidably mounted on said rod and disposed interiorly of the stack, said second screen member being complemental to the first, connecting means between said screen members and a shaft for simultaneously bringing said screen members to their closed or open position and means connected to said shaft whereby the same may be rotated to bring the screen members to their closed and open positions, said means being controllable from a remote point.

9. In a device of the character described, including in combination a stack, a pair of super-imposed screens forming a closure therefor, a central rod with which one screen is secured and the other slidably mounted, a connecting means with said rod and last named screen whereby the screens may be separated or returned to their original positions.

10. In a spark arrester including a main stack, a rod mounted centrally of said stack, a pair of screen members mounted on said rod, one exteriorly and the other interiorly of the outlet of said stack, a connecting means whereby with the rocking movement of said shaft in one direction the screen members will be moved in opposite directions with respect to each other.

11. In a device of the character described, in combination a stack, a screen member over the outlet of said stack, peripheral guides therefor to permit reciprocal movement of said screen, a rod depending from said screen, a second screen complemental to the first named screen slidably mounted on said rod, a connecting means with the rod and lower screen whereby the screens may be reciprocated in opposite directions with respect to each other.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALBERT D. JONES.

Witnesses:
O. C. LANDRITH,
E. D. BALDWIN.